

The need for closer collaboration between the medical and veterinary professions

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It is increasingly apparent that physicians and veterinarians share the same pool of scientific knowledge and that diseases of animals have many direct and indirect connexions with human health. Nowadays it is realized that, given the opportunity, the veterinarian can make substantial contributions to the medical services by (a) controlling zoonoses, (b) supervising the hygiene of food, especially food of animal origin, (c) assisting in the detection and prevention of environmental pollution, (d) facilitating exchange of research information on analogous problems in man and animals, and (e) ensuring a supply of healthy, standardized laboratory animals. Appropriate administrative machinery at government level is necessary to enable the veterinarian to develop and exercise his potential in this field and to ensure full and effective collaboration between the medical and veterinary professions. Conventional veterinary education provides an excellent background for public health work, but special training is also necessary, at both the undergraduate and postgraduate levels, for veterinarians who are to assume responsibilities in public health. A fuller partnership between these two health professions, which have so much in common, should be encouraged in various ways, for example by sharing some courses during university education, and by joint meetings to discuss problems of mutual concern.

As modern civilization evolves, the professions must adjust to the changing needs of the community they serve. After the Second World War the veterinary profession's energies were concentrated particularly on improving the health and productivity of food-producing animals, with emphasis on herd and preventive medicine in intensive farming enterprises. While this continues, there has been more recently a trend toward greater veterinary participation in activities concerned directly with human health. However, veterinary public health has developed very unevenly in different countries, indeed in some countries hardly at all. This article is intended to help those countries that lag behind in this respect to build up veterinary services to human health.

In past centuries the medical and veterinary professions developed separately because the scientific content of their crafts was small, and their occupation with the practical application of empirical remedies to different types of patient kept them distinct. Nowadays physicians and veterinarians share and contribute to the same body of scientific knowledge and many of its practical applications; consequently the two professions have grown closer together. Nevertheless professionalism is still a force tending to keep separate these two health professions and there is need for a more general realization of the oneness of medical science, and for closer medico-veterinary collaboration at the practical level to deal with the various aspects of human health in which animals are implicated.

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Veterinary medicine may be said to have three broad objectives.

1. Advancement of the health and productivity of farm animals on a herd or flock basis.
2. Promotion of the health and wellbeing of animals kept for work, sport, companionship, or laboratory use.
3. Protection and improvement of human health through veterinary public health activities and comparative medicine.

It should be noted that *all three objectives benefit man as well as animals*. However, it is in the fields of veterinary public health and comparative medicine that the benefit to man is most direct, and it is here, especially, that closer collaboration between the medical and veterinary professions is needed.

In the biological sciences, definitions are often hard to formulate, but they are necessary in order to avoid confusion, and they can be amplified and clarified by description. The most concise definition of *veterinary public health* is "the application of professional veterinary skills, knowledge, and resources to the protection and improvement of human health". It is concerned mainly with zoonoses and food hygiene but also extends to related fields such as environmental medicine. It includes the control of animal diseases only in so far as they are a direct hazard to human health. In contradistinction, the control of animal diseases for the sake of animal health is termed veterinary preventive medicine or state veterinary medicine.

The veterinarian adapts easily to public (that is, community) health because veterinary medicine applied to farm animals shares the same outlook, general principles, and epidemiological methods as public health. Both are primarily concerned with population medicine and preventive medicine rather than with sick individuals. Veterinary medicine aims at protecting and promoting the health of the herd or flock, not only by controlling communicable diseases but also through improved husbandry methods, nutrition, and hygiene. Generally veterinary curricula contain more instruction in microbiology, parasitology, and applied epidemiology than do medical curricula.

Zoonoses are defined as those diseases and infections that are naturally transmitted between vertebrate animals and man, especially those diseases with reservoirs in animals.

Comparative medicine is the advancement of medical science by comparing disease phenomena in different species, in particular using knowledge gained by studying a disease in animals to aid in the investigation of the analogous condition in man. An "animal model" is a counterpart of a particular human disease used to investigate the pathogenesis of that disease. It may occur naturally or be produced experimentally. Medical science owes much to comparative medicine. For example protozoa, bacteria, viruses, and mycoplasma were first found to cause diseases in animals and only afterwards in man. The possibility of artificial immunization with attenuated vaccines and with killed vaccines was first revealed in the course of investigations on diseases of animals.

Comparative medicine comes naturally to the veterinarian since by training and practice he is accustomed to studying disease in several species. He can look on man as just one more species. Nowadays medical research is increasingly using animal models to throw light on problems of human disease.

ACTIVITIES APPROPRIATE TO PUBLIC HEALTH VETERINARIANS

Control of zoonoses

There are over 100 diseases that are sometimes communicated from animals to man. Some are only occasionally transmitted to man, or occur only in certain limited areas, but there are a number that are widespread important diseases of man, for example, salmonellosis, brucellosis, tuberculosis (bovine type), leptospirosis, anthrax, rabies, hydatid disease, and several arthropod-borne viral and rickettsial diseases. Several new zoonoses have emerged during recent years, for example African viral haemorrhagic fever (Ebola virus), Marburg disease, Lassa fever, and Kyasanur Forest disease.

The first step toward combating any zoonosis is to conduct a survey in order to understand its epidemiology and to assess its importance as a disease of man. Whether the reservoir of infection is in domestic or wild animals, the veterinarian is the most suitably qualified professional person to organize and supervise these activities, at least so far as the animals are concerned. He may also marshal information reported by the medical profession about human cases, or he may collaborate with a physician in collecting these data. Regulations should require veterinarians and physicians to notify cases of zoonotic infection to the health authorities.

An essential requirement for epidemiological investigations is a properly staffed and equipped laboratory to undertake specific diagnosis. This should be located so that specimens collected in the field can be rapidly delivered there.

The survey of a particular zoonosis must be designed to collect quantitative data on morbidity and mortality in all species involved including man. Geographic distribution, seasonal fluctuations, and routes of transmission must be investigated. Slaughterhouses are a valuable source of information on some diseases. If the disease has an uneven distribution in man, groups with high incidence should be identified and the way they become infected investigated.

The data collected should be marshalled and analysed, and the results made known to appropriate people. When the survey has been carried sufficiently far, a policy decision should be made as to whether a control programme is indicated, and if so, what expenditure of resources is justified. If a programme is to be undertaken it should include continued surveillance as a check on the progress of the programme as well as in order to follow natural fluctuations of prevalence and possible changes in the distribution of the infection. There should be rapid dissemination of epidemiological information. Surveillance should include the tracing of sources of infection that give rise to cases and outbreaks, so that appropriate steps can be taken to prevent further human infection. The programme should also include surveillance of importation of animals of all types, animal products and animal feedstuffs.

Some zoonoses, for example bovine tuberculosis, brucellosis, and salmonellosis, are of great economic importance in animal production as well as important for human health, whereas others are of little importance in animals but more serious in man, for example Q fever, trichinosis, lymphocytic choriomeningitis, psittacosis, hydatidosis, and zoonoses with reservoirs exclusively in pets or wild animals. Control programmes dealing with the former are justified on grounds of animal health as well as human health and are usually organized primarily by the veterinary services in departments of agriculture. The public health veterinarian should collaborate but he will probably play a secondary role. However,

in the case of diseases of little economic importance in animals, the public health veterinarian will have to take the initiative. In nearly all control programmes he will collaborate with various other groups, but often he will be the central coordinator.

It should be borne in mind that zoonotic infections sometimes pass from man to animals, and occasionally back again to man. This has been seen with bovine tuberculosis, salmonellosis, and with infectious hepatitis in apes. The animals must be protected from man as well as man from animals.

It is the rural population that is most affected by many of the zoonoses, so the veterinarian should take a special interest in rural health and offer advice to farmers.

Food hygiene

The traditional role of the veterinarian in this field, and still an important one, is inspection of carcasses at the slaughterhouse and condemning those unfit for human consumption. The role of the veterinarian nowadays extends to general supervision of slaughterhouse hygiene, antemortem inspection of livestock (sometimes including on-farm inspection), and the supervision of the hygienic aspects of the handling and storage of meat and its distribution. In most countries all food of animal origin is under veterinary supervision during production, processing and distribution, and in some countries other foods also are under veterinary supervision. Veterinarians are also responsible for supervision of food hygiene laboratories.

Since the Second World War there have been fundamental changes in the production of many human foods of animal origin, a large part of which is now produced under intensive methods of husbandry. This has greatly increased the incidence of *Salmonella* infections. Expanded international trade in animal feedstuffs and industrialized processing of human foods have further increased the dissemination of *Salmonella*. New hazards have developed as a result of contamination of foods with various feed additives included in the rations of livestock, pesticide residues, antibiotic residues, artificial hormones, and heavy metals. There are also newly recognized hazards due to fungal toxins.

Large-scale fish farming, a relatively new method of food production in most parts of the world, calls for veterinary supervision during production, harvesting, processing, and distribution.

The veterinarian is the only professional whose training, experience and contacts qualify him to take the overall responsibility for food hygiene and enable him to trace various types of contamination to its source and deal with it competently.

It is recognized that the veterinarian is a key figure in food hygiene and he should be given appropriate status and authority so that he can carry out his duties effectively. He should play a part in drafting food legislation and in the establishment of standards for the composition of foods and the maximum levels of biological and nonbiological contaminants.

Environmental medicine

With the introduction of new technologies, with increasing industrialization and urbanization, and with intensification of animal farming ("factory farming"), pollution of the environment has become a serious complication of modern civilization. Establishments practising factory farming, and towns, are encroaching on each other. There are several ways in which the veterinarian can assist in identifying and reducing these hazards.

Traditional methods of disposal of animal manure and carcasses and wastes from slaughterhouses and factories using animal products are proving inadequate in many countries. New methods for the disposal of animal wastes have been introduced but they have not always removed the health hazards and the nuisance caused by the tremendous quantities of organic material, which often contains both pathogenic bacteria and harmful nonbiological substances. Some of these wastes can be recycled by being fed as a small part of the ration of another species, for example by feeding poultry manure to cattle. While these practices help to solve one problem, they create another, because the poultry waste may contain *Salmonella* and certain chemicals that have been fed to the poultry. Recycling household and restaurant garbage by feeding it to animals is a traditional practice which is commendable only if the garbage is thoroughly sterilized, otherwise it sometimes leads to transmission of various diseases of animals, including some zoonoses.

Problems associated with disposal of animal wastes are complex and call for team work, but clearly veterinarians have a part to play in this field. Furthermore, personnel working in establishments dealing with any animal product or waste are likely to be occupationally exposed to zoonotic infections, so these establishments should be under veterinary supervision from this point of view.

Another aspect of environmental medicine of veterinary interest is that diseases in animals sometimes provide a warning of dangerous environmental pollution. For example, nervous disease in cats due to high levels of mercury in the fish they had eaten led to the discovery of the cause of nervous disease in people around Minamata Bay in Japan. Deaths of cattle at a fat stock show in London in 1952 due to cardiopulmonary disease drew attention to the serious ill effects of smog on people. Radioactive iodine in the milk of cows was found to be a valuable indicator of radioactive contamination near a nuclear reactor at Windscale in England. Positioned sentinel animals have been used to monitor arbovirus infections in several countries. Wild mammals, birds, and fish may be a source of information on pollution, by pesticides for example.

Environmental medicine is sometimes concerned with the opening up of new territories by the construction of highways through the wilderness, and the creation of man-made lakes. Such developments disturb the ecology and also expose man to new biological environments. The veterinarian can help by studying the vertebrate animals and arthropods in these areas.

Other fields of veterinary/medical collaboration

Comparative medicine has already been mentioned as a method of research by which veterinary medicine can contribute to the advancement of medical science. Although the public health veterinary officer will probably not be in a position to engage in research along these lines himself, he can keep his medical colleagues informed of new developments in veterinary research that may be relevant to human problems. Being at the interface of the medical and veterinary professions, he is in an excellent position to facilitate exchange of research information in both directions, and where the opportunity occurs, to arrange active collaboration between research workers in the two fields. He can help medical researchers find animal models for human diseases they are investigating.

Laboratory animal production and medicine has developed during recent years into an important aspect of veterinary work. Public health laboratories require high quality laboratory animals and the public health veterinarian can advise on procurement and supervise

the colony. If necessary he can advise on appropriate animals to use for particular experiments and he can assist with the handling, anaesthetizing, and surgery of animals. He can ensure that the necessary precautions are taken to protect personnel from zoonoses, especially where nonhuman primates are used, as they are potential sources of several dangerous diseases.

Another group of hazards that could well fall within the province of the veterinarian are the bites of animals. These include not only bites by various domestic animals, and those by primates and rodents, but also those by venomous animals such as snakes and scorpions. Veterinarians also have a role to play in disaster medicine, especially in relation to animals.

Veterinarians should play a prominent part in the education of the public and special groups, e.g., farmers, animal owners, food workers, on all health matters in which animals and animal products and animal wastes are concerned.

THE PUBLIC HEALTH VETERINARIAN'S POSITION IN THE ADMINISTRATIVE ESTABLISHMENT

A factor that in the past tended to keep the government medical and veterinary services apart was that one was located in the department of health and the other in the department of agriculture. As it became obvious that veterinarians should not restrict their activities to the health of animals, either one of two different administrative arrangements developed: in some countries joint liaison committees were set up, whereas in others a unit staffed by veterinarians was created in the department of health.

Experience over the last 20 years has shown that the veterinary contribution to public health has been greatest in countries where a veterinary public health unit has been established within the department of health, at the national level. Such a unit provides a well recognizable focal point for all aspects of veterinary/medical collaboration and makes it possible for veterinarians to establish medium- and long-term programmes. Veterinarians can only develop fully their potential in this field when they are committed to careers in veterinary public health. Where this administrative structure has not been adopted, joint liaison committees, though less effective, have nevertheless done valuable work, especially in providing a channel for rapid exchange of epidemiological information. An arrangement of this sort is a useful temporary measure until veterinarians have been adequately trained in public health.

As well as the collaboration at national government level, similar arrangements are necessary in state or provincial government departments and in county and municipal administrations. Local government bodies are usually responsible for the administration and enforcement of various laws and regulations concerning food hygiene, the welfare of animals, and the prevention of nuisances by animals and animal industries. Clearly veterinary expertise is required in these matters.

In addition to scientific and technical duties, the public health veterinarian should be given administrative responsibility in those fields in which he is most competent. He should have the opportunity to plan programmes and establish objectives and priorities in consultation with colleagues in the veterinary, medical, and other professions. He should have responsibility for implementing programmes and he should be able to apply modern methods of administration and management.

An important function of the public health veterinarian is to act as a liaison officer—a bridge—not only between the official veterinary and medical services, but also between the veterinary and medical professions generally and between these and animal industries and animal owners. He should not lose his identity as a member of the veterinary profession, as it enables him to collaborate easily with veterinarians in other occupations and with various groups concerned with animals.

TOWARDS A FULLER PARTNERSHIP BETWEEN THE TWO PROFESSIONS

In some countries, collaboration in the fields outlined in this document is already active and continuing to grow, but in other countries more positive action still needs to be taken. Ideally, before a veterinarian assumes responsibility in public health he should have received special training in that field at both the undergraduate and postgraduate levels; however, as an interim measure until fully trained veterinarians are available, progress can be made by arranging short courses in particular aspects of veterinary public health for veterinary graduates selected as showing a special aptitude and interest. Also much can be accomplished by self-teaching from the literature and from on-the-job experience, bearing in mind that conventional veterinary education has already provided an extensive background of relevant knowledge and a good understanding of the principles of population medicine.

Another step is to arrange meetings at which members of both professions discuss subjects of mutual interest. These can be held with advantage alternately at veterinary schools or research institutes on the one hand and in hospitals or medical research institutes on the other.

During undergraduate education, there are many opportunities for medical and veterinary students to share the same courses and this helps toward bringing the two professions together. Where there is a medical school and a veterinary school in the same university, veterinary students can take part of their course together with medical students in the following subjects: biochemistry, pharmacology, physiology, anatomy and histology, general pathology, and microbiology. Even though only parts of these courses are common to the medical and veterinary curricula, the specifically veterinary parts of the subjects may still be taught in the same university departments by veterinarians appointed to the staff of those departments. These veterinarians can also help with some of the teaching of the medical students.

Apart from the academic advantages both to the teachers and to the students, and the financial saving to the university in sharing courses, there are benefits in students from different faculties mixing together socially. They form long-lasting friendships which help collaboration later during their professional lives.

Teaching in the general principles of veterinary public health is now integrated into the undergraduate curriculum of veterinary schools in a number of countries. This includes the principles and practice of epidemiology and biostatistics, which are important for work in animal health as well as human health. To avoid overloading an already full curriculum, zoonoses control and the prevention of human infection are usually taught as part of the course on infectious diseases of animals. Food hygiene is taught as a subject in its own right but the students will have already received a sound training in microbiology as part

of their instruction in infectious diseases. Teaching in environmental health at the undergraduate level is usually not extensive but introduces the student to the general principles of disposal of animal wastes, air and water pollution, ionizing radiation, occupational hazards associated with animal industries, residues in food, and disaster medicine. Also, it is useful to give medical students a few lectures introducing them to the subject of veterinary public health.

It is hardly feasible to include in the undergraduate course sufficient training in veterinary public health to equip a new graduate to take a post in which he is responsible for all aspects of the field. In the long term, specialist training will be the main factor in bringing about effective collaboration between the professions, so whenever possible, formal post-graduate courses should be taken by veterinary graduates intending to make a career in veterinary public health. These are best taken in a school of public health. They cover the subjects mentioned above at a more advanced level and include the legal aspects of the subject and some practical experience. They will also introduce the veterinarian to the epidemiology of the common communicable diseases of man. The courses should also include some instruction in modern methods of administration in the health field.

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RÉSUMÉ

Nécessité d'une collaboration plus étroite entre les professions médicale et vétérinaire

A mesure du développement des sciences médicales, il est apparu que la santé des hommes et des animaux était souvent liée et qu'elle ne pouvait que gagner au rapprochement des deux disciplines qu'exercent médecin et vétérinaire. Dès la fin de la Deuxième Guerre mondiale, les vétérinaires ont été appelés à jouer un rôle de plus en plus important en santé publique car ils devaient veiller à la salubrité des aliments d'origine animale requis en quantité accrue. Depuis, leur participation directe à l'action de santé publique s'est aussi développée, mais cette tendance est plus ou moins marquée et il importe qu'une collaboration plus poussée entre médecins et vétérinaires s'instaure dans tous les pays.

La médecine vétérinaire a trois objectifs principaux dans la civilisation moderne:

- 1) assurer la santé et la productivité du cheptel;
- 2) veiller à la santé et au bien-être des animaux associés aux travaux ou activités sportives de l'homme, des animaux de compagnie et des animaux de laboratoire;
- 3) améliorer la santé humaine au moyen de l'action vétérinaire de santé publique et de la médecine comparée.

La « santé publique vétérinaire » recouvre l'application des connaissances professionnelles vétérinaires à la protection et à l'amélioration de la santé humaine, et elle englobe aussi bien l'hygiène alimentaire et la lutte contre les zoonoses dangereuses pour l'homme que la salubrité de l'environnement; les soins donnés aux animaux en l'absence de préoccupations de santé publique rentrent dans le cadre de la médecine vétérinaire préventive. La conception même de la santé publique est familière au vétérinaire habitué à veiller à la santé des troupeaux dans leur ensemble, aussi bien en luttant contre les maladies qu'en encourageant de meilleures méthodes d'élevage; les programmes d'études vétérinaires sont d'ailleurs plus étoffés dans les domaines de la microbiologie, de la parasitologie et de l'épidémiologie appliquée que ne le sont les programmes de médecine.

Dans ses activités de santé publique, le vétérinaire est appelé à lutter contre un grand nombre de maladies qui frappent aussi bien l'homme que l'animal (à des degrés et avec des implications variables), comme la salmonellose, la brucellose, la tuberculose, la leptospirose, le charbon, la rage, l'hydatidose et plusieurs maladies à virus ou rickettsies transmises par les arthropodes. Il s'y ajoute des maladies nouvellement apparues comme la fièvre hémorragique causée par le virus d'Ebola, la maladie de Marburg et la fièvre de Lassa. Le vétérinaire et le médecin doivent être l'un et l'autre astreints à notifier toutes les infections de cet ordre aux autorités sanitaires, et il ne faut pas oublier à ce propos que la transmission peut s'effectuer aussi de l'homme à l'animal, pour être parfois ensuite retransmise à l'homme. Le vétérinaire doit disposer à cette fin des concours requis en personnel et en services de laboratoire. Les abattoirs constituent une source importante d'information. Après la mise en route éventuelle d'un programme de lutte, les effets de celui-ci doivent être surveillés et notifiés. La surveillance doit s'étendre à toutes les sources possibles d'infection, y compris l'importation d'animaux ou de produits d'origine animale.

Il incombe traditionnellement au vétérinaire d'inspecter les carcasses dans les abattoirs et cet examen englobe maintenant le bétail destiné à l'abattage ainsi que la manipulation et le stockage de la viande; les laboratoires d'hygiène alimentaire sont placés sous le contrôle de vétérinaires. Les méthodes intensives d'élevage, ainsi que le développement du commerce international des aliments pour bétail et de la transformation industrielle des aliments humains, ont accru l'incidence et la propagation de *Salmonella*. A ce risque s'ajoutent ceux de contamination par additifs alimentaires intentionnels ou non et par toxines fongiques. La pisciculture se développe également partout et elle ne doit pas échapper à l'inspection vétérinaire. Pour toutes ces tâches, le vétérinaire doit être investi de l'autorité nécessaire et il devrait participer à l'élaboration de la réglementation et des normes pertinentes.

Urbanisation et « élevage industriel » vont de pair et contribuent à la pollution de l'environnement. L'élimination des déchets animaux — qui peuvent contenir des bactéries pathogènes et des substances dangereuses — pose un grand problème. Quant aux déchets humains (ordures ménagères), ils peuvent aussi se révéler dangereux pour les animaux qu'ils servent à alimenter. Il arrive que certaines maladies diagnostiquées chez l'animal constituent un signal d'alarme à la pollution (qui ne se rappelle les chats de Minamata?). On recourt d'ailleurs parfois à des animaux « sentinelles » dans les enquêtes épidémiologiques sur les infections à arbovirus, et les animaux sauvages sont une source d'information sur la pollution par les pesticides. Le vétérinaire peut aussi participer à l'étude des vertébrés et des arthropodes dans les régions où l'écologie est perturbée par la construction de routes ou de lacs.

En médecine comparée, l'échange d'informations et l'organisation de la collaboration

entre chercheurs des deux disciplines sont principalement la responsabilité du vétérinaire, qui peut notamment fournir les modèles animaux nécessaires — tout comme les animaux de laboratoire, dont il lui appartient de contrôler la qualité. Le vétérinaire peut également participer aux expériences sur l'animal et veiller à la protection du personnel de laboratoire manipulant en particulier des primates non humains. Enfin, le vétérinaire a un rôle important à jouer dans l'éducation du public et notamment des groupes de population spécialement concernés, comme les ruraux.

Au niveau des services administratifs, l'institution d'une unité de santé publique vétérinaire au sein du ministère de la santé s'est révélée le meilleur moyen d'assurer une coordination efficace des activités vétérinaires et médicales, dans le cadre de programmes à moyen et à long terme en particulier. A défaut d'une telle unité, un comité de liaison — notamment pour l'échange d'informations épidémiologiques — peut constituer une bonne solution provisoire. Cette collaboration doit aussi s'instaurer au niveau provincial, avant tout pour assurer l'application des lois et règlements relatifs à l'hygiène alimentaire. Mais le rôle d'officier de liaison du vétérinaire s'exerce aussi bien sur le plan professionnel que sur le plan administratif, et il doit être soucieux de préserver son identité professionnelle. Il est toujours profitable d'organiser des réunions entre médecins et vétérinaires dans des écoles ou instituts de recherche de l'une ou l'autre discipline alternativement.

Le vétérinaire assumant des responsabilités de santé publique devrait avoir reçu une formation de niveau universitaire et postuniversitaire. Des cours de brève durée peuvent être organisés à l'intention de vétérinaires déjà diplômés, et l'auto-éducation est tout à fait possible dans ce domaine. Il est aisé d'organiser des cours communs pour les étudiants des deux disciplines (médicale et vétérinaire) dont les écoles sont souvent réunies au sein d'une même université, et les sujets afférant plus spécialement à l'art vétérinaire peuvent être enseignés par des vétérinaires aux étudiants des deux disciplines. Les principes de la santé publique vétérinaire — et leur application pratique en ce qui concerne notamment l'épidémiologie et la biostatistique — sont maintenant inclus dans les programmes d'études vétérinaires de nombreux pays, et la prévention de l'infection chez l'homme fait généralement partie des cours sur les zoonoses. L'enseignement de la microbiologie que comportent ces derniers prépare les étudiants à aborder l'hygiène alimentaire. La salubrité de l'environnement est cependant encore souvent absente des programmes universitaires, et il faut donc mettre l'accent sur la formation postuniversitaire — de préférence dans une école de santé publique — de spécialistes de la santé publique vétérinaire qui pourront jouer un rôle essentiel dans la collaboration entre les deux professions.